A.D. 1864, *6th June.* N° 1405.

Domestic Telegraph Apparatus.

LETTERS PATENT to William Henry Preece, of the Town and County of Southampton, Civil Engineer, for the Invention of "Improved Domestic Telegraphic Apparatus."

Sealed the 25th November 1864, and dated the 6th June 1864.

PROVISIONAL SPECIFICATION left by the said William Henry Preece at the Office of the Commissioners of Patents, with his Petition, on the 6th June 1864.

I, William Henry Preece, of the Town and County of Southampton, Civil Engineer, do hereby declare the nature of the said Invention for "Improved Domestic Telegraphic Apparatus," to be as follows:—

The object of this Invention is to simplify the construction of domestic telegraphic receiving instruments, and to facilitate the operation of reading the transmitted signals. To this end I discard the use of alphabetical signs as now commonly practised, which necessitate the spelling out of words and sentences letter by letter, and occasion frequent mistakes unless read by experienced persons, and for these I substitute the use of numbers which will refer to a written or printed key or code of signals attached to or placed near the signal receiving instrument and representing the usual requirements of the household such as "dinner," "tea," "bread," or "coals." The numbers used may either be audible beats or numerals temporarily brought into view or audible and visible numbers combined. The simplest means of carrying out the object of my Invention will be by the use of a bell arrangement. Two bells are placed within reach of a hammer which is hung between and operated by two electro-magnets. The bells will be of different sizes to give well marked differences of tone, the deeper tone when struck representing tens and the higher tone units. By bringing this apparatus into connection with a battery in any well known manner, and thereby throwing a current of electricity into one or other of the electro-magnet coils, the hammer suspended between the bells will be attracted by the active magnet and caused to strike one or other of the bells, which strokes may be quickly repeated to produce the number answering to the order on the printed code of signals that is desired to be transmitted.

As a modification of this instrument I use nine numerals for the units with a bell attached for indicating the tens as before. The numerals are carried at the end of rock levers mounted like the hammer above mentioned between electro-magnets by which it is caused to rock and present to a slot in a fixed screen (behind which it works) either a numeral or a blank as required. These rock levers and also the hammer that operates the bell, together with their electro-magnets, are contained in a box of which the front forms the slotted screen and the bell is mounted above it. In place of mounting the numerals on rock levers I may employ two revolving discs to carry the numerals and present them up to a slit or opening in the side of the box in which they are mounted. These discs may be worked by means of electro-magnets and receive a step-by-step motion through clicks and ratchet wheels operated in any ordinary way. The numbers of one disc will indicate units and of the other tens.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said William Henry Preece in the Great Seal Patent Office on the 6th December 1864.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, William Henry Preece, of the Town and County of Southampton, Civil Engineer, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters

Patent, bearing date the Sixth day of June, in the year of our Lord One thousand eight hundred and sixty-four, in the twenty-seventh year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said William Henry Preece, Her special license that I, the said William Henry Preece, my executors, administrators, and assigns, or such others as I, the said William Henry Preece, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time, and at all times thereafter during the term therein expressed, should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "IMPROVED DOMESTIC TELEGRAPHIC APPARATUS," upon the condition (amongst others) that I, the said William Henry Preece, by an instrument in writing under my hand and seal, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said William Henry Preece, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the Drawings hereunto annexed, and to the letters and figures marked thereon (that is to say):—

The object of this Invention is to simplify the construction and use of telegraphic receiving instruments so as to render them generally applicable to domestic purposes. Hitherto the operation of reading transmitted signals has only been mastered after considerable practice, I now however discard the use of alphabetical signs as commonly practiced which necessitate the spelling out of words and sentences letter by letter, and occasion frequent mistakes unless read by experienced persons, and in substitution of these I employ a printed key or code of signals forming an appendage to the signal receiving instrument, and representing the ordinary requirements of the household as dinner, tea, bread, coals, &c. These items when numbered may be referred to by audible beats of the instrument corresponding to the appended numerals or in the absence of numerals by a portion of the printed key or code being temporarily brought into view.

In Sheet I. of the accompanying Drawings, Fig. 1 shews in elevation a domestic telegraphic receiving instrument in which a bell arrangement is employed for indicating by means of sounds the numeral on the printed code to which reference is to be made. The front of the case being removed to shew the interior arrangement.

This apparatus consists of two electro-magnets A, A^1, mounted in a metal frame B, and secured by brackets to the case C. Between the poles of these magnets is suspended from the frame B an iron pendulum or pendant armature D, carrying at its lower end a hammer head. In a line with the axis of this hammer head are the centres of two cup shaped bells E, E^1, which are secured to the case of the instrument and are made of different sizes so as to produce sounds having a marked difference of pitch or quality. One of these bells, say the smaller E^1, I use for designating units, and the other E for designating tens; thus one blow of the hammer on the bell E^1 will denote 1, and a blow immediately succeeding it on the bell E will with the sound before struck refer the receiver of the signal to No. 11 on the printed code, and so on throughout the series. One end of the wire coiled around the magnet A passes to a clamping screw *a* and thence out of the case of the instrument to the battery, and the other end of the wire passes to the clamping screw *b* and thence to one of a pair of operating keys by which the electric circuit is made and broken and the magnets are set in action, as is well understood by all persons familiar with this class of mechanism. The ends of the wire of the coils A^1 are similarly brought to clamping screws a^1 and b^1, and are led off the battery and to a second key.

Fig. 2 shews an arrangement of keys suitable for transmitting signals to the receiving instrument the depression of one key completing the circuit between the battery and one electro-magnet and that of the other performing the like office for the other electro-magnet. It will now be understood that when the current is thrown into the coils of the magnet A the pendulum will be drawn in the direction of the arrow and will strike the bell E thus indicating that reference is to be made to No. 10 of the code for the nature of the signal intended to be transmitted. As soon as this is effected the operator by releasing the depressed key from the pressure of the finger will allow it to rise. The circuit will thereby be broken and the magnet ceasing to attract will let the hammer fall back to its quiescent position. To indicate units the other key is brought into use and depressed one, two, or more times in succession, to indicate any required number short of 10 by a corresponding number of blows being delivered on the bell E^1 in rapid succession by the hammer. Attached to any convenient part of the apparatus will be the printed code forming a key to the transmitted signals. This I arrange somewhat after the following manner:—

No.	Transmitted Order.	No.	Transmitted Order.
1	Breakfast.	11	Dinner.
2	Bread.	12	Wine.
3	Butter.	13	Coffee.
4	Hot Water.	14	Tea.
5	Cold Water.	15	Supper.
6	Coals.	16	Cook.
7	Luncheon.	17	Coachman.
8	Cheese.	18	Footman.
9	Ale.	19	Housemaid.
10	Stout.	20	Nurse.

From the above example it will be obvious that any desired expansion or variation may be given to the code to suit the varied requirements of different households. When however a very limited code is required to be used I further simplify the mode of transmitting signals by directing the attention of the receiver of the message solely to the code attached to the instrument after attention has been drawn to the fact of the instrument being in action by the sounding of an ordinary bell.

In Sheet II., Fig. 1 shews in front elevation, and Fig. 2 in sectional elevation an arrangement of apparatus for presenting to view the signals, message, or order desired to be transmitted; and Fig. 3 shews in front view the apparatus which I employ for giving the movement to the working parts.

In front of the case A I provide an opaque fixed screen A^1 with a slot in it of sufficient size to present to view one division of a disc or ring which carries the code of signals, messages, or orders intended to be transmitted. Behind this screen and mounted upon an axle B is a disc C on the face of which the code of messages or orders is arranged radially, as shewn at Fig. 1. This disc I work by means of electro-magnets imparting to it a step-by-step motion through clicks, and operating upon a ratchet wheel keyed to the axle B; D and D^1 are two magnets which attract the armatures E. These armatures rock upon their centres *d*, *d*, and carry at their inner extremities clicks or ratchets *e*, E^1, which clicks are jointed thereto. Adjusting springs F, F^1, are provided for returning the armatures to their quiescent position. By means of this, or any other well known arrangement of step-by-step movement, I give an axial motion to the disc through the instrumentality of operating keys as already described, and am thus enabled to bring up rapidly to sight the order required to be transmitted. If thought desirable the disc may be driven by a clock movement attached to the axle B. In that case the electro-magnetic apparatus will serve simply to intermit the action of the clock movement.

An obvious modification of this mode of transmitting signals for domestic purposes by the use of a rotating disc is to key an indicator arm on the axle B and to fix the code of signals arranged as shewn at Fig. 4 on a fixed screen or disc.

Having now set forth the nature of my Invention of "Improved Domestic Telegraphic Apparatus," and explained the manner of carrying the same into effect I wish it to be understood that under the above in part recited Letters Patent, I claim,—

First, the arrangement of apparatus constructing and operating as described with reference to Sheet I. of the Drawings.

Second, transmitting orders by the aid of a written or printed code substantially as above described with reference to Sheet II.

In witness whereof, I, the said William Henry Preece, have hereunto set my hand and seal, the Sixth day of December in the year of our Lord One thousand eight hundred and sixty-four.

W. H. PREECE. (L.S.)

Witness,
J. W. Moffatt,
66, Chancery Lane.

LONDON:
Printed by George Edward Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty. 1864.

A.D. 1864, June 6. Nº 1405.
PREECE'S SPECIFICATION.

(2 SHEETS)
SHEET 1.

FIG. 1.

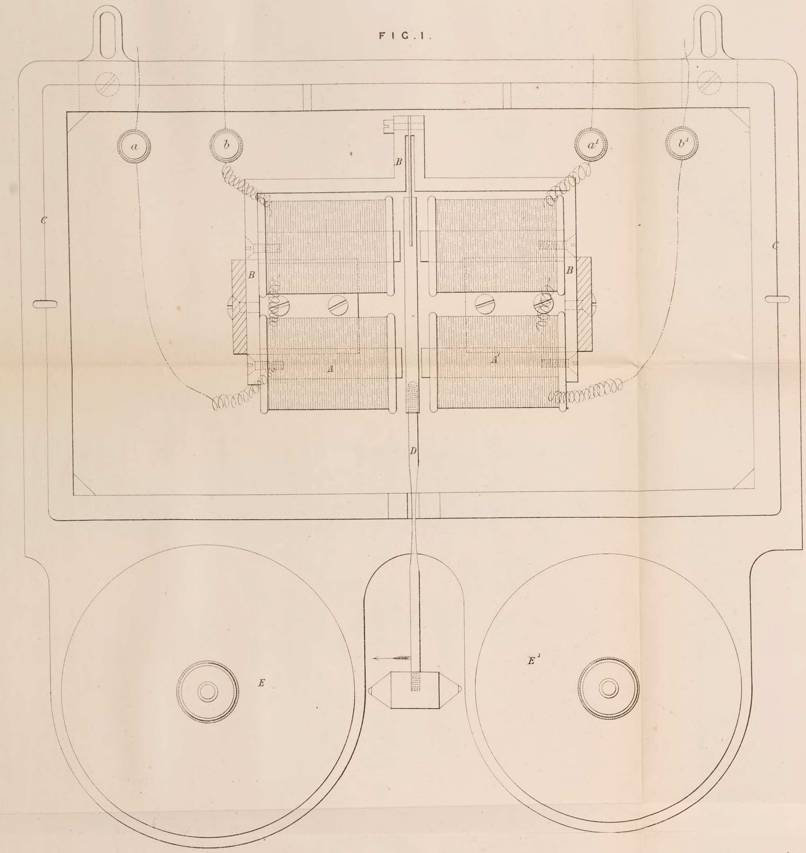
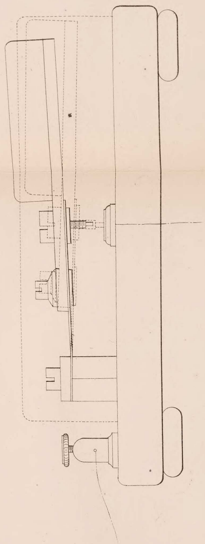


FIG. 2.



The filed drawing is partly colored.

Drawn on Stone by Malby & Sons.

London: Printed by George Edward Eyre and William Spottiswoode,
Printers to the Queen's most Excellent Majesty. 1864.

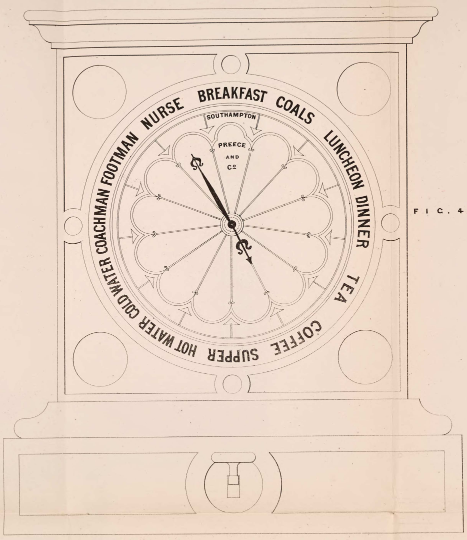
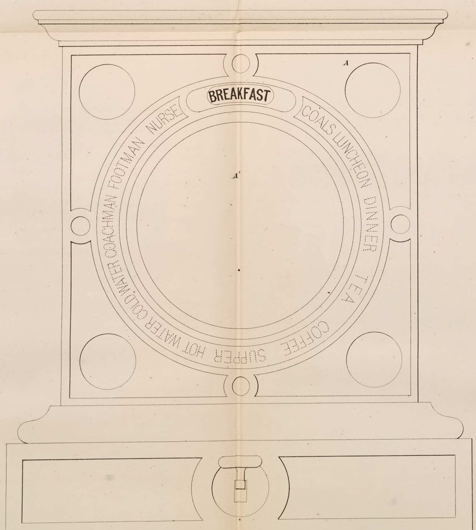


FIG. 4.

FIG. 1.



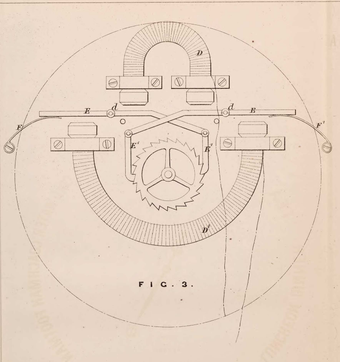
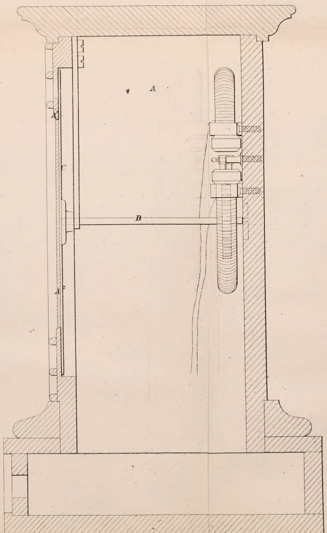


FIG. 3.

FIG. 2.



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